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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/734,221

12/15/2003

Hiroyuki Nagasawa

246179US-90 DIV

8639

22850

7590

05/16/2006

EXAMINER

OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.  
1940 DUKE STREET  
ALEXANDRIA, VA 22314

SPEER, TIMOTHY M

ART UNIT

PAPER NUMBER

1775

DATE MAILED: 05/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/734,221	NAGASAWA ET AL.	
	Examiner	Art Unit	
	Timothy M. Speer	1775	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 02 March 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-8, 10 and 12-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 8-10 and 12-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 1, 2, 4, 7, 10, 12, 13, 14 and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Nakano (USPN 6,416,578) for reasons of record in the Office action dated 10/05/05. With respect to this ground of rejection, applicant's arguments are addressed hereinafter.

3. Claimd 1-3, 10, and 12-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Kobashi (USPN 5,923,054).

Kobashi teaches a substrate comprising a compound single crystal having a surface, wherein the substrate comprises a basal plane (abstract for instance). The substrate may, for

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instance, be formed of a III-V material, as presently claimed. Moreover, it is the Examiner's position that the surface of the substrate will necessarily exhibit defects in the surface of the basal plane wherein the surface energy of the defect is higher than that of the basal plane. These areas correspond to the presently claimed "at least one polar plane portion." Such materials inherently possess defects having surface energies both higher and lower than that of the basal plane. It is this characteristic that the present invention seeks to exploit, by preparing substrates having only the former type of defect, viz., defects having a higher surface energy than the basal plane. By eliminating defects having lower surface energy, propagation of the defect in subsequently grown layers is avoided. The present claims, however, are not limited to such substrates and it is the Examiner's position that the prior art comprises defects having surface energies higher than that of the basal plane, as presently claimed.

4. Claims 1-3, 5, 6, 8 rejected under 35 U.S.C. 102(b) as being anticipated by Davis (USPN 6,051,849).

Davis teaches materials single crystal materials comprising the presently claimed materials (abstract, figure 3, and accompanying text for instance). Regarding the presently claimed "polar plane portion," it is the Examiner's position that such defects are inherent in the materials of Davis for reasons of record with respect to Kobashi, *supra*, which are incorporated herein by reference. The presently claimed materials inherently possess defects having the presently claimed characteristics. Therefore, it is the Examiner's position that the present claims are anticipated by Davis.

***Response to Arguments***

5. Applicant's arguments filed 03/02/06 have been fully considered but they are not persuasive. Applicant has amended the present claims to recite that the crystal comprises a basal plane and a polar plane portion on the surface of the crystal. The claims do not, however, as asserted by applicant, require the polar plane portion to be formed on the same face of the crystal as urged by applicant. Accordingly, this argument is not persuasive.

6. Moreover, as discussed above, compound single crystal materials, such as those of Norimoto, inherently possess "polar plane portions" as presently claimed and such defects would necessarily be formed in the surface of the basal plane. Again, it is this characteristic that the present invention seeks to overcome, by eliminating defects having a surface energy lower than that of the basal plane, thereby eliminating propagation of such defects in subsequently grown layers. The claims as presently written, however, do not exclude the presence of such defects and, accordingly, are not distinguishable from the applied prior art.

***Conclusion***

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

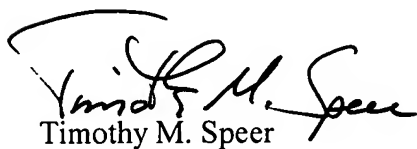
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CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy M. Speer whose telephone number is 571-272-8385. The examiner can normally be reached on M-Th, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on 571-272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Timothy M. Speer

  
JENNIFER C. MCNEIL  
SUPERVISORY PATENT EXAMINER

5/15/06